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ABSTRACT

This paper discusses the use of technology in gifted students' curriculum, methods that have been successfully used in classrooms, and the wealth of technological resources available to both the teacher and student. The paper describes how technology has been used to teach science, art, and enhance other subjects. Internet Web sites and various types of software for enrichment are presented. (Contains 11 references.) (CR)

Technology: An Enrichment Tool for the Gifted Student

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Abstract

This paper will present an argument for the use of technology as an enrichment tool for the gifted student. A discussion of the use of technology in the gifted student's curriculum will be addressed. Second, the methods that have been successfully used in classrooms will be discussed. The final aspect of the paper will focus on the wealth of technological resources available to both the teacher and student. Specifically, Internet web sites and various types of software for enrichment will be presented for implementation in the gifted students' curriculum. This paper will encourage the use of technology to enhance the education of the gifted student.

Technology: An Enrichment Tool for the Gifted Student

The need to define and implement basic curriculum goals for the use of technology as an enrichment tool is essential for the education of the gifted student. Schools around the country are writing technology plans and addressing the many questions associated with incorporating computers into the curriculum of diverse student populations. Educators need to ask the basic question of "Can our children benefit from the use of computers in the classroom?" The schools who have modified curriculum, making the most effective use of technology, find that the use of computers increase creativity, analytical skills and the students' ability to effectively communicate (Furger, 1998). The resources available to the teacher can help to integrate subject matter and curriculum into a beneficial learning experience for the exceptional student. The basic goal for education is to develop students' skills that will enable them to be productive members of society. Therefore, a gifted students' technological abilities will empower the student for success in the technology driven work force of today.

In fact, a knowledge of the technology tools available to the student is an essential workplace skill. In a recent study of technology in the workplace Kim, Kydd and Morrison (1998) suggest that search skills are important for success in business and in turn, it makes information the most valuable product produced by workers. The authors state, "Knowledge application replaces knowledge accumulation as a primary component in the learning process" (Kim et al., 1998, p. 264). Furger (1998) suggests that gifted students can make the most effective use of computers and related technology by developing research and presentation skills. The recommendation of Furger (1998) is that students develop skills which will enable them to sort and analyze data and enable the student to communicate with people around the world through the use of electronic mail.

However, the student must go beyond the mechanical usage of technology. The gifted student must become an independent learner and self-starter. Kim et al.(1998) advocate that the core of the gifted students' curriculum be problem solving which addresses and solves real-world situations by the use of technology. The educators' responsibility to the exceptional student using technology is to introduce new aspects and guide the student in the acceptable uses of the information gathered by the student.

As a result, teachers across the nation are finding that the use of technology is changing their approach to teaching the gifted child. Litvin (1998) found that:

> "A lot of kids are writing longer, they're writing better, they're feeling more free to edit things, they're more able to look at complex math concepts, they're more a able to communicate visually," says former electronics instructor Glenn Magle, who now directs technology training for 40 school districts in Cook County, Illinois. (p. 19)

Specifically, Litvin (1998) emphasis the need for relevance between the daily life of the student and the integration of technology in the curriculum. Litvin (1998) found this statement in a recent SCANS report by Ed Gragert, director of the nonprofit organization I*earn which links 3,000 schools in forty-eight countries via the Internet:

> You look at the kinds of skills we're talking about needing in the next generation and you're talking about technology, critical thinking, being able to interact with people, writing skills. ... If you are in fashion design, can you imagine how enriching it is to share cross-culturally different concepts of fashions, and crafts and engineering? (p. 19)

The relevance of using technology as a tool for enrichment for the gifted student can be appealing both to the student and the teacher.

For example, in 1998, Furger found at Taylorsville Elementary School in Taylorsville, Indiana that computers were used to enrich students learning. She stated, "Computers and related technology are used to support self-paced, individualized learning" (Furger, 1998, p. 84). The students have access to computers in their classroom, library and also in a computer lab. Furger (1998) reported that students and teachers had extensive technological training to ease the anxiety of developing skills to do classroom projects. Although encouraging students to use technology is relatively easy, incorporating curriculum into these experiences can be challenging. Furger (1998) states that "...Judith Seidel, coordinator of computer instruction at The Brearly School on Manhattan's Upper East Side wants to integrate relevance into the curriculum, "We want the girls to use the computer to create products that have meaning for them" (p.146). Experiences using technology can be expanded into all areas of curriculum including science instruction.

Specifically, computer-based simulations into science instruction can enrich the learning experience for the gifted student. Windschitl (1998) states, "Computer-based simulations of scientific phenomena provide learner-centered environments within which students can explore systems, manipulate variables, and test hypotheses" (p.92). This can give the gifted student the experience of exploring new areas of learning. Fisher (1997) offers the opinion that technology can accomplish two aspects of education for the gifted student. He states that "the opportunity to explore new areas of knowledge in an educationally rigorous manner, and to engage in interesting independent learning activities will greatly benefit the student and teacher" (Fisher, 1997, p.71).

To illustrate, Davis (1993) suggests that teachers use technology to enhance subject content by using multimedia programs for social studies and the arts. Morrison (1998) states, "Students must learn to work, learn, and flourish...in an Infosphere" (p. 262). The use of the Internet can be used as tool to accomplish the specific goals set for the gifted student. Fisher (1997) states, "Through innovative multimedia technology, the era of differential computer learning has emerged as potentially the most powerful gifted education tool of our age and the future" (p. 71). Community-based art education has been recommend by numerous art educators. Marche` (1998) found that students in rural Stinesville, Indiana benefited both academically and socially from the use of the Internet in developing their art project:

> Seventeen fifth-grade students were identified as potentially gifted/talented in academics, art, or music using locally devised measures. This group of independent, energetic, high-ability learners included some with a history of competitive, uncooperative, and mildly-aggressive behaviors. Starting in September 1995, one hour each week was devoted to building group social skills through sharing interests and concerns. Students established rules of courtesy during this hour that eventually carried over to other school situations. By the time intensive historical research was underway, the group had ceased bickering among themselves, and teachers began to notice growing cohesiveness and cooperation. (p.12)

Guidelines for teaching art and the gifted student must include interdisciplinary art education which integrates art activities with other areas of the curriculum (Ulbricht,1998). He stated, "Students should be encouraged to consult references in diaries, photo albums, magazines, encyclopedias, dictionaries, and on the Internet to

acquire contextual information" (Ulbricht, 1998, p. 17). The Internet is a powerful tool that if it is used with aggressive guidance a teacher can help the student develop the technological skills needed for the future.

The Internet: A Technology Tool

In fact, there are many available Internet subscription sights that provide instructional service for the teacher and student. Herzberg (1998) listed *Scholastic Network* at http://www.ScholasticNetwork.com as a site that provides virtual field trips for students around the world. He also suggested the use of site *I*EARN* at http://www.iearn.org, which is an active site that provides projects in science, the environment and social studies. Herzberg (1998) listed the site *Sites alive!* at http://sitesalive.com as a location on the Internet that will provide the teacher with semester length sessions. A specific teacher information site is CCCNet at http://www.cccnet.com. It offers teachers a free Internet link for collaboration with their peers. (Herzberg, 1998, p. 78) A teacher using a World Wide Web search engine, such as Yahoo, to locate additional educational sites, will find it beneficial for themselves and the student.

In addition to web sites for teacher resources, there are a number of excellent Internet sources appropriate for the student to use as an educational tool. These Internet sites have specific web sites with information for the arts, sciences, math, English, history and other relevant subjects. These web sites include interactive sites in which students can actively learn through the use of problem solving techniques. One such site is The Great Plant Escape, http://www.aces.uiuc.edu/uplink/gpe/, in which students can learn about plants by solving a series of mystery games. An excellent math site providing brain teasers is http://www.eduplace.com/math/brain/ by Houghton Mifflin. The use of the

Internet to study history is an excellent tool to meet the needs of the gifted student. A very good index to history is http:/www.hartford-hwp.com/gateway/index.html. This site provides the student with information for historical research. In addition to these web sites, a teacher can find additional appropriate sites my utilizing a search engine such as Studyweb, http:www.studyweb.com/, to enrich the gifted students' curriculum.

Software: A Technology Tool

In addition to using the Internet, software programs are a multimedia tool that can be successfully used by the gifted student. Two excellent technology enrichment tools are multimedia encyclopedias and art/music on CD-ROM. Fisher (1997) found that a multimedia encyclopedia such as Microsoft *ENCARTA* gives the gifted student a multi-sensory experience in learning. Fisher states, "In studying about birds, a child not only reads about the characteristics of different species, but can also see them in motion and hear their unique calls" (Fisher, 1997, p.72). The use of CD-ROM information programs allows the student to fully assimilate the learning experience into a relevant application to his or her world. For instance, the CD-ROM available from the Corbis Publishing Company entitled, *A Passion for Art: Renoir, Cezanne, Matisse and Dr. Barnes*, presents hundreds of masterpieces that the student can use to explore the world of art (Fisher, 1997). The use of random and specific search areas, such as compositional and media uses by a specific artist, peak the interests of the gifted student by leading the student to new ideas. Fisher states, "Multimedia resources, as represented by CD-ROMs and the Internet, provide the gifted student with virtual museums of fantastic learning opportunities to help them engage in the highest possible levels of differentiated learning" (Fisher, 1997, p.75). There are many technological resources available for the student and teacher to use which will enrich the learning experience.

Additional resources include software programs that are designed specifically for the special interests of the student. For instance, Lindroth (1998) recommends Sunburst's *Author's Toolkit* for developing writing and research skills for the gifted student. The student who is interested in writing can develop skills for report writing and stylized formats for publishing their work. The program also includes organizational tools which would benefit the teacher's assessment portfolio for the gifted student. Similarly, Fisher (1997) recommends the CD-ROM, *Library of the Future*. It contains over 3,500 books, stories and historical documents that the gifted student will find fascinating. Fisher (1997) states, "There are many possibilities for opening up the world of great literature and great ideas to gifted students by using the *Library of the Future* CD-ROM or similar types of programs" (Fisher, 1997, p. 73). In fact, the wealth of technical resources available to both the teacher and student are phenomenal. As a result of these abundant available resources, the use of technology as an enrichment tool is an exciting element available for the educational process of the gifted student.

Indeed, preparing students for the twenty-first century with the knowledge and skills necessary to succeed requires the use of technology. The evidence that technology improves the gifted student's analytical skills, increases their creativity and enables the student to increase communication skills necessitates that technology be included in the curriculum for the gifted student. An adequate program of education for gifted children incorporates identification, motivation, and development of technological skills that are relevant in the world in which the student lives. In conclusion, the gifted student can and must learn about the relevant usefulness of technology by the retrieval and exchange of information and ideas. The enrichment tool of technology gives the gifted child an opportunity to be actively involved in the educational process and will empower the student for success in the technology driven work force of today

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